# STATISTICAL METHODS FOR QUALITY CONTROL OF METAXA COGNAC

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The implementation of control diagram is being studied at reception of Metaxa cognac orders in boxes of 6 bottles at distribution store. The control diagram will measure the degree of filling of the bottles. The sample was formed from 24 bottles contained in four boxes. Each bottle has a beverage volume of V = 700 mL.

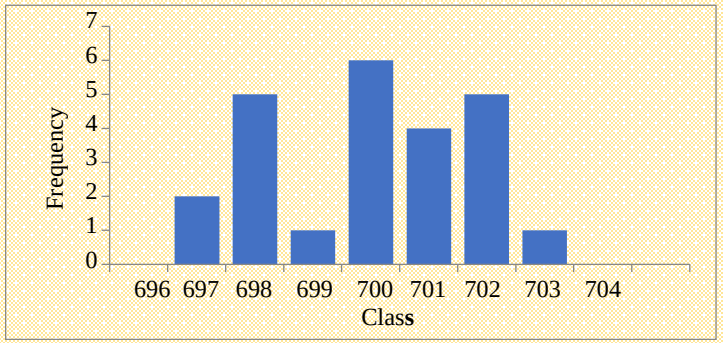


Fig. 1- Histogram of the data from the selected sample.

To set the control limits, check whether the filling volume data is distributed normally.
As can be seen, the shape of the histogram is not relevant to determine whether the sample data are normally distributed. One cause is the presence of few data in the sample.

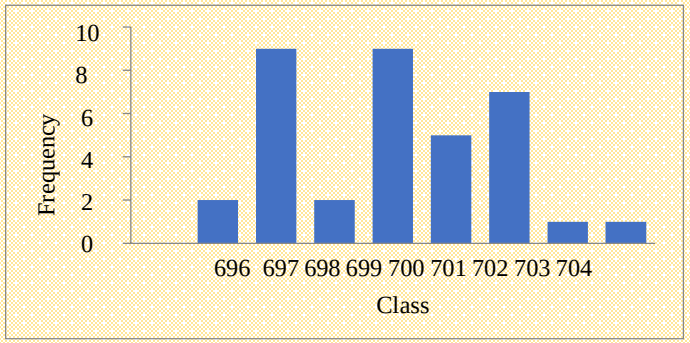


Fig 4 - Histogram of the data from the sample with n = 36 elements

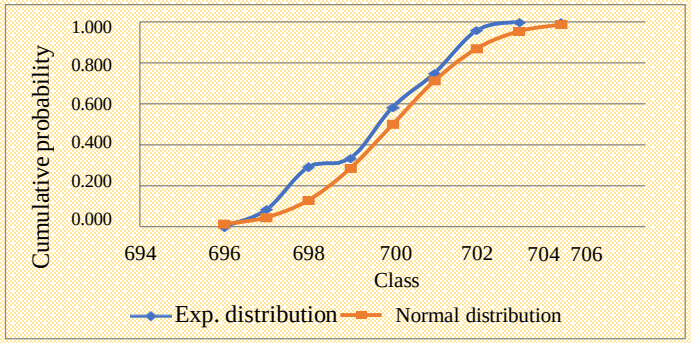


Fig. 5 - Comparison between experimental and normal distributions for the sample n = 36 elements.

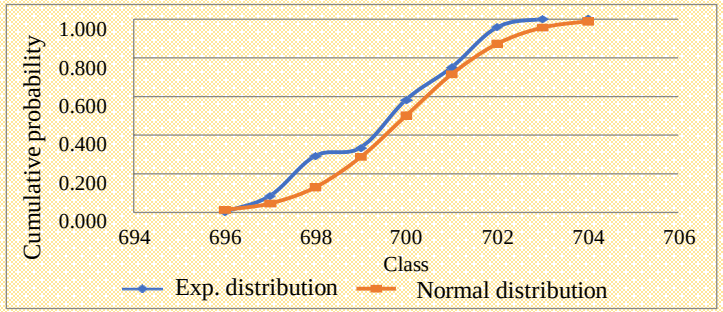


Fig. 2 - Comparison between the experimental data distribution and the corresponding normal theoretical distribution

The constant distribution of experimental data is not described by the normal distribution.

The deviations between the experimental and normal distributions are reduced for the sample by n = 36.
As a result, the limits of the control diagram will be established with the data of this sample. 700 ± 1.00 mL.

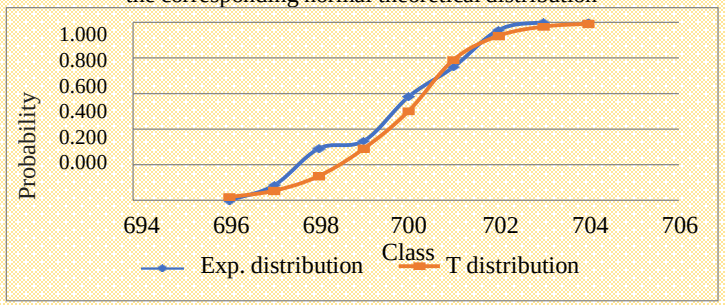


Fig. 3 - Comparison between experimental probabilities and T for the sample with n = 23 elements

As the data distribution is observed, the sample with n = 23 elements is described with smaller errors than the T distribution compared to the normal distribution.

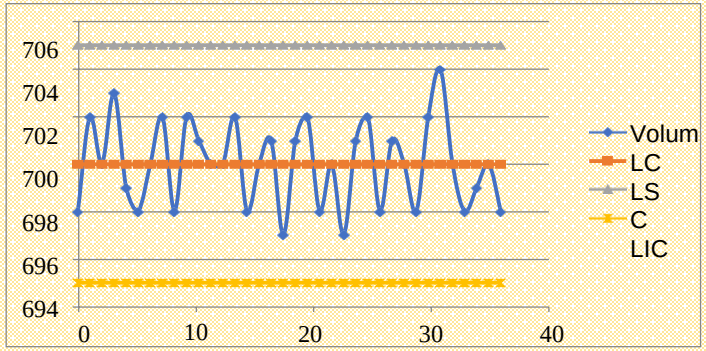


Fig. 6 - Diagram used to control the filling degree of Metaxa bottles of 700 mL

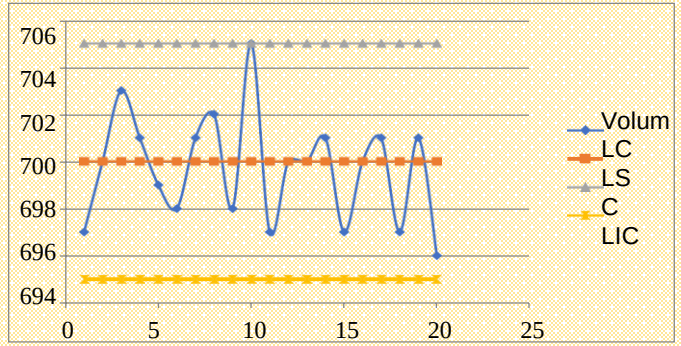


Fig.7 - Control diagram for the analysis of the filling degree of Metaxa cognac bottles of 700 mL from the randomly selected sample with n = 20 elements

Upon receipt of the batch of 20 boxes of 6 bottles, it is found that all samples fall within the established control limits.